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Term limits and voter turnout

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Abstract

This paper studies the impact of term limits on voter turnout, using the recent introduction of term limits at the local government level in Portugal as a natural experiment. Although instrumental, expressive, and information-based theories of voter participation imply effects of term limits on turnout, this is clearly an under-researched topic. Applying a difference-in-differences approach to data at both the municipal and parish levels, we find strong evidence that the introduction of term limits increased voter participation. Our results contrast with previous findings for California and demonstrate that more research on this topic is clearly necessary.

Keywords: Term limits, Voter turnout, Local elections, Portugal, Natural experiment
JEL: D72, H7, K16

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1. Introduction

In democratic societies public decisions should reflect the will of citizens. Elections allow voters to choose their representatives, i.e. those who have the power to take public decisions. Therefore, the citizens' decision of whether to vote or not has political and economic consequences. For several decades, many scholars have studied the determinants of voter participation. There is now an extensive and fast-growing literature on voter turnout, which covers a wide variety of its potential socio-economic, political and institutional determinants (see Cancela and Geys, 2016). However, quite surprisingly, this huge literature has devoted almost no attention to the effects that term limits may have on voter participation.

The main purpose of the present study is to help fill this gap in the literature by studying the impact of term limits on voter turnout, using the Portuguese case as a natural experiment. A law approved in 2005 stipulates that mayors and parish presidents cannot serve for more than three consecutive terms in the same municipality/parish. This law became binding in the 2013 local elections, preventing 52% of the mayors and 29% of the parish presidents from running for reelection. This led to a significant turnover of local candidates, which may have affected voter turnout.

Term limits have existed for a long time at the presidential level in countries such as the United States. More recently, mainly since the late 1980s, several American states also imposed term limits to governors and legislators. Countries such as Brazil, Italy and, subsequently Portugal, introduced term limits at the municipal level. There is a growing literature studying a wide range of potential effects of term limits on matters such as public policy,[3] electoral competition and campaign finance (e.g., Ansolabehere and Snyder Jr., 2004; Hall, 2014; Masket and Lewis, 2007), career decisions (e.g., Lazarus, 2006; Powell, 2000), effort of legislators (Dal Bó and Rossi, 2011), corruption (Ferraz and Finan, 2011), pork-barrel (Aidt and Shvets, 2012; Bernhardt et al., 2004), political budget cycles (Klein and Sakurai, 2015; List and Sturm, 2006; Veiga and Veiga, 2016), and many others (see

[3]See, among others, Alt et al. (2011), Besley and Case (1995, 2003), Cummins (2012), Keele et al. (2013), Lewis (2012), and Veiga and Veiga (2016).

Mooney 2009 for a survey). But, to the best of our knowledge, there is only one study focusing directly on the effect of term limits on voter turnout. Nalder (2007) analyzes the effects of state legislative term limits using data from state legislative races in California, from 1976 to 2004.[4] Contrary to the claims of term limits advocates, she found evidence of a negative effect of term limits to state legislators on voter turnout.

Do these results for California imply that term limits always have negative effects on voter turnout? Not necessarily. First, voters from other regions and countries may react differently to term limits. Second, term limits to legislators and to executives may have different effects. Third, state legislative elections are relatively less important than other concurrent elections, and lack of name recognition of non-incumbents may discourage voter participation. Fourth, the results may be different in countries/regions with different institutions and electoral rules. Therefore, it is too soon to conclude that term limits discourage voter participation, and more analyses of the effects of term limits are clearly necessary.

We believe that our research on the Portuguese natural experiment can move forward the literature on this topic in several ways. First, the introduction of term limits at the local level provides a unique opportunity to analyze the consequences of this institutional reform on voter turnout. We do it by applying a difference-in-differences approach to panel datasets comprising all 308 Portuguese municipalities and 2,163 parishes. Second, the aftermath of term limits have, so far, been studied only for California. Other states' and countries' experiences, especially at the local/municipal level, may provide useful insights for countries with similar institutional systems. Third, while in the US the states decide on the adoption of term limits, and term-limit laws vary from state to state, in Portugal the institutional reform was exogenously imposed by the national parliament, and the same law applies to all local governments, rendering the estimation of the term-limit treatment effect less problematic than when cross-state or cross-country datasets are

[4]Also focusing on California, but using a survey of cities, Hajnal and Lewis (2003) examine the effects of several municipal institutions, including term limits, on voter turnout. Their results suggest that term limits do not have a direct effect on turnout.

used. As Herrera et al. (2014, p. 132) point out, empirical studies on turnout based on cross-national comparisons are likely to suffer from a number of confounding variables and measurement challenges. Finally, our results indicating that the imposition of term limits has increased voter participation in Portuguese local elections suggest a potential positive contribution of term limits to democracy and gives new hopes to term limits advocates.

The paper is structured as follows. Section 2 presents a review of the literature on voter participation, and discusses arguments for why the introduction of term limits might affect turnout. Section 3 describes the Portuguese local governments institutional setting. The data and the difference-in-differences econometric models are described in Section 4. Section 5 reports and comments the econometric results, and Section 6 concludes.

2. Voter participation and term limits

A fundamental question in democratic societies is why people vote at all. According to rational choice theory, the decision of whether to vote depends on the benefits and costs individuals expect to derive from the act of voting. The benefits depend on the expected utility of electing the preferred candidate and on the probability that the vote is pivotal. However, since the latter is usually very small and easily outweighed by the trouble of going to the voting station, the expected payoff of voting is nearly zero (Downs, 1957; Owen and Grofman, 1984). Yet, many people actually vote, which is known as the paradox of voting (Fiorina, 1976; Grofman, 1993).

Theories to explain observed participation levels at elections can be grouped into five groups (Dhillon and Peralta, 2002):[5] instrumental, expressive, boundedly rational voter, group based, and information-based. Instrumental theories presume that individuals vote because they care mainly about the consequences of the electoral process, including the need to avoid the collapse of democracy (Downs, 1957). Under this assumption, when elections are close races the payoffs of voting increase because the probability of a single vote being pivotal is higher, which leads to higher turnout (Downs, 1957; Riker and Ordeshook, 1968). Expressive theories suggest that people derive utility from expressing

[5]See also the surveys of Blais (2006) and Geys (2006b).

their attitudes when voting, and the utility from voting may increase from bandwagon effects in elections (Fiorina, 1976; Schuessler, 2000; Hamlin and Jennings, 2011; Brennan and Brooks, 2013; Blais and Galais, 2016). Boundedly rational voter theories weaken the assumption of full rationality of voters, while group based theories explore the coordination mechanisms between members of a group of voters (namely, parties) that may increase the likelihood of determining the outcome of the election. Finally, the last group of theories highlights the importance of information on the decision of whether to vote or not. It argues that less informed voters may be better off delegating their decision to informed voters (Feddersen and Pesendorfer, 1996, 1999; Matsusaka, 1995).

Since the 1960s, numerous studies have analyzed empirically the determinants of voter turnout.[6] The explanatory variables used in turnout studies are generally grouped into three main categories: socio-economic, political, and institutional (Geys, 2006a; Cancela and Geys, 2016). Regarding socio-economic variables, population size, concentration, and proportion of minorities are generally found to have negative effects on turnout, while population stability, income and ethnic homogeneity, education, and past turnout have positive effects. As for political variables, close elections, campaign expenditures, and higher political fragmentation are found to promote turnout. Institutional variables are arguably the most powerful determinants of turnout (Jackman, 1987; Franklin, 1996). Proportional electoral systems seem to increase turnout relative majoritarian/plurality systems (Blais and Aarts, 2006). Additionally, compulsory voting and concurrent elections generally promote turnout, while more stringent registration requirements tend to decrease it (Garmann, 2016; Jaitman, 2013). Taking advantage of a larger sample of studies, Cancela and Geys (2016) separately analyze the determinants of turnout in national and subnational elections. They find that campaign expenditures, closeness of elections and registration requirements have greater explanatory power in national election studies, while population size and composition, concurrent elections, and the electoral system are

[6] A recent meta-analysis (Cancela and Geys, 2016) considers 185 studies of turnout using aggregate-level data. This literature is not only numerous, but is also fast-growing, as a previous version of that meta-analysis (Geys, 2006a) included just 83 studies published between 1968 and 2004.

more important in subnational elections.

It is surprising that this huge literature on the determinants of voter turnout has almost ignored the potential effects of term limits, specially because some studies (Jackman, 1987; Franklin, 1996) argue that institutions are the most powerful determinants of turnout. The explanations of voter turnout underlying instrumental, expressive voting, and information-based theories provide us good reasons to believe that term limits may influence turnout.

First, instrumental theories suggest that term limits may increase voter participation by making elections more competitive and dynamic. By forcing out incumbents, they increase the number of open races, encouraging more candidates to run. Second, by ousting entrenched and disconnected incumbents, the introduction of term limits may inspire more citizen confidence in the system, increase the utility derived from expressing one's preferences, and lead to bandwagon effects. Finally, information-based theories predict both a positive and a negative effect of term limits on voters' mobilization. On the one hand, they may increase voter confusion and disinterest by introducing a greater number of unknown non-incumbents into electoral contests, leading to lower turnout. But, on the other hand, particularly at the time of the introduction of the institutional change, media coverage of local elections may increase significantly, decreasing the costs of acquiring relevant information for voting. The results of Nalder (2007) regarding the effects of state legislative term limits in California support the former view, suggesting that they decreased voter turnout. However, in the Portuguese case, given the significant attention devoted by the national and local media to the 2013 local elections, we believe the latter result prevailed.[7]

We contribute to this scarce literature on the effects of term limits on voter turnout

[7]Besides the normal interest that the institutional change generated in the media, the approval of the law introducing term limits led to a strong discussion on whether it prevented lame-ducks from running for mayor in other municipalities. The case was submitted to several court instances, with contradicting sentences. Only a few days before the election, did the constitutional court put an end to the argument by clarifying that the candidacy for mayor in other municipalities would be possible.

by analyzing the effects of the recent introduction of term limits at the local government level in Portugal. Since readers may be unfamiliar with the country's local government institutions, a brief description of the Portuguese setting is provided in the next section.

3. The Portuguese setting

Portugal is a unitary state,[8] with 308 municipalities (278 of which are in the mainland), all subject to the same legal and institutional framework. Each municipality is then subdivided into a varying number of parishes (*freguesias*), which are currently 3,092 (they were 4,260 before the territorial reorganization of parishes of 2013).

Municipalities have a deliberative branch, the Municipal Assembly, and an executive branch, the Town Council. More than half of the Municipal Assemblies' members are elected directly by voters, and the remaining members are the presidents of the parishes' assemblies that belong to the municipality, who are also elected directly by voters. The mayor is the president of the Town Council and has a prominent role in the executive branch. Besides the mayor, the Town Council includes between four to sixteen additional members, depending on the number of voters registered in the municipality. All of its members are elected directly by voters, who vote on party or independent closed lists. Mandates are assigned according to the d'Hondt method, and the first candidate of the list receiving most votes becomes the mayor. Similarly, the first candidate of the most voted list for the parish assembly becomes its president.[9]

The elections for the Municipal Assembly, the Town Council and the Parish Assembly are always held on the same day, and there are no other concurrent elections. At the polling station, each voter receives three ballots of different colors, one for each local election, indicates with an X the preferred party or independent list of citizens in each of the ballots, and then inserts them in three separate boxes. Due to this voting procedure, voter turnout is practically equal for the three elections. The first local elections after

[8]Regional governments only exist in the archipelagos of Madeira and Azores.

[9]Institutional aspects, such as the electoral system, registration requirements, and voting procedures are exactly the same in all localities. Voting is not compulsory in any Portuguese election.

the reestablishment of democracy in 1974 were held in December of 1976. Terms were three years long until 1985, when they were extended to four years. Elections were held in December until 2001, and subsequently in late September or October.

Until the 2013 local elections, there were no legal limits on the number of consecutive terms a mayor or a parish president could serve in office. A law approved in 2005 (Law n. 46/2005) imposed a three-term limit for both, prohibiting them from running for reelection in the same municipality/parish.[10] This law became binding in the 2013 elections, forbidding 160 mayors and 884 parish presidents from running for reelection.

Given that 52% of all mayors and 29% of the parish presidents could not run for reelection in the 2013 elections, this legislative reform led to a significant turnover of candidates and to many open races, whose result was more difficult to predict than if the incumbents could run for reelection (around 80% of the mayors were usually reelected in the previous elections). Increased competition and higher media coverage may have induced Portuguese voters to participate more in local elections. However, many voters may have felt frustrated for not being able to re-elect a term-limited incumbent, or for not knowing most of the candidates, and decided not to show up at the polls. Thus, the effect of the imposition of term limits at the local level in Portugal is a priori uncertain.[11]

4. Data and econometric models

Panel data models are estimated for the 308 Portuguese municipalities and for 2,163 parishes where term limits were applicable in 2013, covering the local elections of 1997,

[10]The term limit counter was set back to zero for the presidents of the 2,078 parishes that were affected by the territorial reorganization of 2013, which imposed the amalgamation of several small parishes. Thus, in the 2013 elections, binding term limits were only applicable in the 2,182 parishes whose territorial boundaries had remained exactly the same. These are the ones considered in the empirical analysis below, so that the comparison of turnout before and after the introduction of term limits is not influenced by the effects of territorial reorganization on voter participation. Due to missing values, a maximum of 2,163 parishes is considered in the regressions.

[11]For previous studies of turnout in Portugal, see Freire and Magalhães (2002), Freire et al. (2012), Martins and Veiga (2013), and Tavares and Carr (2013).

2001, 2005, 2009, and 2013. Municipal election and other political data was obtained from the Portuguese Internal Affairs Ministry (MAI), census and demographic data from the National Institute of Statistics (INE), unemployment data from the Institute for Employment and Professional Training (IEFP), average wages in the private sector from the *Quadros de Pessoal* database of the Ministry of Labor, Solidarity and Social Security (MTSSS), and local finance data from the Directorate General of Local Authorities (DGAL).

Regarding parishes, election and political data are available from MAI for all elections since 1976, but data for other variables can only be obtained from the Census conducted every 10 years by INE. We collected data from the Censuses of 1991, 2001 and 2011. Only 2001 coincides with a local election year. Thus, in order to have data on demographic and socio-economic variables for the other election years, we generated annual data through linear interpolation until 2011, and extrapolation afterwards.

The effect of the introduction of binding term limits at the local government level on voter turnout is assessed in a difference-in-differences (DD) framework. Since 160 mayors and 884 parish presidents were lame ducks in their 2010-2013 terms, while the others were eligible for reelection, we can consider the municipalities/parishes of the term-limited mayors/presidents as the treatment group, and those of the eligible ones as the control group.

The DD framework requires that treated and control municipalities and parishes exhibit similar trends before term limits became binding (in the pre-treatment period of 1997 to 2009). Since we are not absolutely certain that the common trends hypothesis holds,[12] we control for region-specific trends in all regressions. According to Angrist and Pischke (2009, 238-241), this allows treatment and control municipalities/parishes to follow different trends in a limited but potentially relevant way.

[12]Appendix A shows the averages of the participation rates in treated and control municipalities (top graph) and parishes (lower graph) until 2009. The averages behave in a similar way, although the difference in participation rates between treated and control municipalities seems to increase slightly over time.

The baseline DD model for municipalities can be summarized as follows:

$$Turnout_{it} = \alpha + \delta TLMayor_{it} + \mathbf{X}'_{it}\gamma + \mu_i + \lambda_t + \theta_i.t + \varepsilon_{it}. \quad (1)$$

$$i = 1, ..., 308 \qquad t = 1997, 2001, 2005, 2009, 2013$$

where $Turnout_{it}$ is the percentage of registered voters that turned out to vote[13] in the elections for the Town Council in municipality i in year t, $TLMayor_{it}$ is a dummy variable that equals 1 in 2013 for the municipalities that had term-limited mayors in the term 2010-2013 (the treated group), and equals zero otherwise. The parameter δ measures the treatment effect, X_{it} is a vector of control variables, μ_i is the specific effect of municipality i, λ_t are time effects (election dummies), $\theta_i.t$ is a time trend for the NUTS III region[14] of municipality i, and ε_{it} is the error term.

Since there are three concurrent local elections (Town Council, Municipal Assembly, and Parish Assembly), a voter's decision to participate in the elections for the Town Council may also be affected by whether her parish president is term-limited or not. Thus, to account for this possibility, we include the *Share of voters with term-limited parish president* in the vector of control variables. Vector X also comprises a set of economic, socio-demographic and political control variables, listed in Table 1, which have been found to affect voter participation in previous studies.[15]

[13]Although other turnout measures have been used in the literature (see Cancela and Geys, 2016), this is the one that in the Portuguese context better measures the percentage of potential voters who actually voted. An alternative definition is used in the robustness checks (Appendix B).

[14]NUTS is the European Union nomenclature for territorial statistical units. Portugal is subdivided into three NUTS I regions (Mainland, Azores and Madeira), seven NUTS II regions, and 25 NUTS III regions. Each NUTS III region aggregates several municipalities, which correspond to the NUTS IV level. Including municipal specific trends in equation (1) is a viable alternative, but it unnecessarily inflates the model with 307 trends and, as shown in Appendix B, the results remain essentially the same.

[15]Several variables which were found to affect turnout, especially in cross-country studies, are not relevant for Portuguese municipal elections: (1) institutions and electoral rules are the same in all localities; (2) there were never national, regional, or European concurrent elections; (3) ethnic homogeneity is quite high in Portugal, making the proportion of minorities a somewhat irrelevant issue, for which no data is available. There is no municipal data on campaign expenditures, and they are less relevant at the local level. Finally, data on income inequality is not available at the local level.

Table 1: Control Variables

VARIABLES	Expected Sign	Related Literature
Economic variables		
Unemployment rate	+	Charles and Stephens (2013)
		Burden and Wichowsky (2014)
Log(Average real wage)	-	Kusara and Suryanarayan (2015)
Log(Own revenues - real per capita)	+	Andersen et al. (2014)
Socio-demographic variables		
Log(Population)	-	Cancela and Geys (2016)
Population growth (absolute value)	-	Cancela and Geys (2016)
Share of population over 65 years old	+	Blais (2006)
Share of pop. with less than primary education	-	Blais (2006)
Share of pop. employed in the tertiary sector	-	Martins and Veiga (2013)
Political variables		
Effective number of parties (Town Council)	+	Geys (2006a)
Mayor's margin of victory (previous election)	-	Cancela and Geys (2016)
Party similarity (mayor and prime minister)	-	Martins and Veiga (2013)
Presence of independent lists	+	Martins and Veiga (2013)
Average past vote share of left-wing parties	-	Lijphart (1997)
Average past turnout	+	Cancela and Geys (2016)

An extended version of the baseline DD model of equation (1) is applied at the parish level. The main differences are as follows. First, instead of the share of voters with term-limited parish president in a municipality, we include a dummy variable that equals one when the parish president is term-limited, and equals zero otherwise ($TLPres_{it}$). Second, in order to account for a possible additional effect when both the mayor and the parish president are term-limited, an interaction variable is also included in the model ($TLMayor_{it} * TLPres_{it}$). Third, vector $\mathbf{P}_{it}$ includes the control variables for which data at the parish level is available. Finally, control variables at the municipal level are considered

in vector $\mathbf{M}_{it}$.[16] This extended model is summarized in equation (2):

$$\begin{aligned} Turnout_{it} &= \alpha + \delta TLMayor_{it} + \beta TLPres_{it} + \\ &\varphi(TLMayor_{it} * TLPres_{it}) + \mathbf{P}'_{it}\rho + \mathbf{M}'_{it}\eta + \mu_i + \lambda_t + \theta_i.t + \varepsilon_{it}. \\ & i = 1, ..., 2163 \qquad t = 1997, 2001, 2005, 2009, 2013 \end{aligned} \tag{2}$$

Descriptive statistics of the above-described variables, for samples of 308 municipalities and 2,163 parishes are presented in Tables C.3 and C.4 of Appendix C.

We start by estimating the models of equations (1) and (2) by fixed effects, with robust standard errors clustered, respectively, by municipality and by parish.[17] After estimating a model with all explanatory variables described above, we check for eventual multicollinearity problems by analyzing variance inflation factors (VIFs) for the independent variables specified in our linear regression models. Then, after excluding the variables with the most problematic VIFs, we use the Akaike (AIC) and Schwartz (BIC) information criteria to select the most appropriate parsimonious model.

The fact that participation rates are bounded between zero and one implies that OLS (or fixed effects) may not be the most appropriate method to estimate the models of equations (1) and (2). Although a logistic transformation of the dependent variable (as proposed by Dubin and Kalsow, 1996) could be applied, so that it would no longer be bounded, predicted values from an OLS regression cannot be guaranteed to lie within the unit interval (Papke and Wooldridge, 1996). In order to overcome these potential problems, we also estimate the models using two methods designed for fractional dependent

[16] For these variables, all parishes belonging to the same municipality have the same values (there is only municipal and time variation). This is the case of average real wages and of own revenues per capita, for which there is no parish level data. We also include the municipal political variables in vector $\mathbf{M}_{it}$, as the elections for the Parish Assembly and Town Council are concurrent.

[17] Clustered standard errors are robust to heteroskedasticity and to correlation among the observations for the same territorial unit. According to Angrist and Pischke (2009, 308-323) they are also a reasonably safe solution to deal with serial correlation, as long as there is a relatively large number of clusters (which is our case). Hausman tests (results available upon request), for both municipalities and parishes, clearly indicate that fixed effects models are more appropriate than random effects models.

variables: the fractional probit model, which allows for a dependent variable that is greater than or equal to zero and less than or equal to one;[18] and, the beta regression estimator (see Ferrari and Cribari-Neto, 2004), which accommodates dependent variables that are greater than zero and less than one, which is the case of turnout rates in municipalities and parishes.

5. Empirical results

This section presents and describes the results of the estimation of the models of equations 1 and 2 for samples comprising 308 municipalities and 2,163 parishes, respectively. In both cases, the local elections from 1997 to 2013 are considered. The results of a series of robustness tests are also briefly described.

5.1. Results for municipalities

The results of the estimation of the baseline model of equation (1), by fixed effects, are reported in the first column of Table 2. The coefficient of the dummy variable for term-limited mayors is statistically significant, and there is evidence of a positive treatment effect. Concretely, the results indicate that voter participation rates in elections for the Town Council increased by 1.13 percentage points in treated municipalities relative to control municipalities. With a mean participation rate of 63.87% (see Table C.3), the treatment effect is roughly 1.8%, which is relatively small, but by no means negligible. There seems to be an additional effect on turnout when parish presidents are also term-limited. When the share of voters with term-limited parish presidents increases by one standard deviation, turnout increases by roughly 0.18 (=10.84*0.0165) percentage points.

These results for the effects of the imposition of term limits to Portuguese local governments are the opposite of those of Nalder (2007), who found evidence of a small negative effect of state legislative term limits in California. Therefore, contrary to her, we find

[18] See Papke and Wooldridge (1996) for an application of fractional response regression to participation rates of employees in firms' retirement plans.

evidence supporting the claims of term limits advocates that they promote voter participation.

Regarding the impact of economic variables, the unemployment rate and average real wages seem to have positive effects on turnout, while own revenues per capita are not statistically significant. The results for unemployment are consistent with Burden and Wichowsky (2014) and Charles and Stephens (2013), who found evidence of a mobilization effect of economic hardship.[19] The positive effect of real wages supports our prior that poorer citizens are less likely to vote than wealthier ones (Kusara and Suryanarayan, 2015).

Consistent with the results of previous studies (Blais, 2006; Martins and Veiga, 2013), the share of the population over 65 years old and the presence of independent lists have positive effects on turnout, while population, absolute population growth (a proxy for demographic stability), the margin of victory, party similarity, and the share of the population with less than complete primary education have negative effects. Finally, the effective number of parties, the share of the population employed in the tertiary sector (a proxy for urbanization), and average past turnout do not seem to affect voter participation.[20]

The next step of the empirical analysis was to check for problems of multicollinearity by analyzing variance inflation factors (VIFs) for the variables included in the model of

[19]Taking into account that Martins and Veiga (2013) found evidence of an inverted U-shaped relationship between unemployment rates and turnout, we also tried models which included the squared unemployment rate. It was never statistically significant. It is possible that the recent economic crisis, associated with record-high unemployment rates, changed the way in which Portuguese voters react to this variable when deciding whether to vote or not (Martins and Veiga, 2013, used data until 2005).

[20]Given that several previous studies found that turnout is persistent, we include the average turnout rate in the three previous elections as an explanatory variable. This moving average of past turnout rates represents the structural voter participation in each municipality better than lagged turnout, which may be strongly affected by shocks in turnout specific to the previous election. Nevertheless, this paper's conclusions regarding the effects of term limits on turnout are unchanged if we use lagged turnout instead of average past turnout. The results are not shown here, but are available from the authors upon request.

Table 2: Term Limits and Voter Turnout - Municipalities

	(1)	(2)	(3)	(4)
VARIABLES	Fixed Effects	Fixed Effects	Frac. Probit	Beta Reg.
Term-limited mayor	1.131***	0.985***	1.052***	1.070***
	(3.33)	(2.83)	(3.19)	(3.27)
Share of voters with term-limited parish president	0.0165*	0.0172*	0.0173*	0.0174**
	(1.81)	(1.84)	(1.96)	(1.99)
Unemployment rate	0.180***	0.196***	0.201***	0.204***
	(2.75)	(3.06)	(3.16)	(3.18)
Log(Average real wage)	3.551**			
	(2.51)			
Log(Own revenues - real per capita)	0.00492			
	(1.27)			
Log(Population)	-11.75***	-12.48***	-12.00***	-11.82***
	(-5.59)	(-7.01)	(-7.00)	(-6.92)
Population growth (absolute value)	-0.0619**	-0.0648**	-0.0662**	-0.0656**
	(-2.04)	(-2.18)	(-2.35)	(-2.35)
Share of population over 65 years old	0.187**			
	(2.31)			
Share of population with less than primary education	-0.385***	-0.411***	-0.370***	-0.366***
	(-3.61)	(-4.12)	(-3.79)	(-3.75)
Share of population employed in the tertiary sector	-0.126			
	(-1.52)			
Effective number of parties (Town Council)	0.136			
	(0.53)			
Mayor's margin of victory (previous election)	-0.0479***	-0.0497***	-0.0498***	-0.0497***
	(-6.09)	(-7.69)	(-7.77)	(-7.73)
Party similarity (mayor and prime minister)	-0.403**	-0.440***	-0.432***	-0.433***
	(-2.52)	(-2.72)	(-2.76)	(-2.77)
Presence of independent lists	1.115***	1.109***	1.130***	1.139***
	(4.19)	(4.04)	(4.22)	(4.24)
Average past vote share of left-wing parties	-0.0122			
	(-0.80)			
Average past turnout	0.0683			
	(1.16)			
Number of observations	1,474	1,493	1,493	1,493
Adj. R^2 (FE), Pseudo R^2 (Frac. Probit)	0.664	0.652	0.0213	
Log-likelihood	3,633	3,657	-955.9	3,668

Notes: The estimation method used in each regression is indicated in the title of the respective column. All models include municipal and election fixed effects, and NUTS III region-specific trends. Marginal effects (in percentage points) are reported for Fractional Probit and Beta Regression methods. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

column 1. We found that several had very large VIFs,[21] leading to a mean VIF of 50.3, which is clearly problematic. After excluding the collinear variables, we searched for the most appropriate parsimonious model using the AIC and the BIC as references for model selection. This resulted in the model of columns 2 to 4.

The empirical results are practically the same, regardless of the estimation method used. Since the estimated coefficients of fractional probit and beta regression models are not easily interpretable, we report marginal effects instead. These indicate the effect on turnout, in percentage points, of a one-unit change in an explanatory variable. For example, they indicate that the participation rate increased by 1.05 to 1.07 percentage points in treated relative to control municipalities.

The increase in turnout in municipalities of term-limited mayors may result from increased competition, as the absence of a candidate with incumbency advantage places all candidates on more equal grounds.[22] Additionally, long periods in power by some mayors may de-mobilize voters, as elections may be seen as a mere formality to perpetuate the incumbent mayor and entrenched interest groups. But, if the withdrawal of the incumbent mayor solves these problems, turnout should increase when reelection-eligible mayors do not run. In order to test this possibility, we included a dummy variable for those cases in the baseline DD model of equation (1).

The results of fractional probit and beta regression estimations of this extended model are shown in columns 1 and 2 of Table 3.[23] They indicate that turnout does not tend to be affected when an incumbent mayor, who is not term-limited, does not to run for reelection.

[21] E.g.: *Log(Average real wage)*, 1078.5; *Log(Own revenues - real per capita)*, 298.5; *Average past turnout*, 184.3; *Share of population over 65 years old*, 55.7; *Effective number of parties (Town Council)*, 47.5. These large VIFs may help explain why some of these variables (including past turnout) are not statistically significant.

[22] On average, during the pre-treatment period, 83% of the incumbent mayors ran for reelection. Of these, 86% were reelected. These numbers indicate that incumbents benefited from a substantial advantage over their opponents. They help explain why many mayors managed to stay in office for decades.

[23] To economize space, only the coefficients of the variables related to term limits are shown. The estimation of the model by fixed effects gives essentially the same results.

A possible justification for this result is that, in most of these cases, the incumbent mayors did not expect to win the next elections. If that was the case, incumbency advantage was small, or nonexistent, and the withdrawal of the incumbent mayor would not significantly increase the competitiveness of the elections. Since the results regarding the dummy variable for term-limited mayors are very similar to those shown in Table 2, the effect of term limits on turnout seems to go beyond the mere withdrawal of the incumbent mayor (a competition effect). It is also possible that the removal of more than half of the mayors at the same time, and the attention it received from the media,[24] had a considerably greater impact on voters' decisions to participate in the 2013 elections than the somewhat sporadic withdrawals that occurred in previous elections. That, expressive voting and information-based motives may have played an important role in the 2013 local elections, leading to increased voter participation in the municipalities of term-limited mayors.

A deeper analysis of the data indicates that the percentage of reelection-eligible mayors who did not run was considerably smaller in 2013 (5.5%) than in the previous elections (average of 14.9%). This reduction in voluntary withdrawals may be due to the fact that mayors now know that the limit of three consecutive terms in office will soon be binding, forcing them to step down. But, this implies that the dummy variable *Reelection-eligible mayor does not run* is endogenous. Besides being affected by the coming into force of binding term limits in 2013, the decision of the incumbent mayors to run or not for reelection may also depend on personal characteristics (e.g., age), on time in office, and on the likelihood of winning the next elections. The latter will be related to control variables, such as the unemployment rate and the margin of victory obtained in the previous election. This potential endogeneity implies that the coefficients of columns 1 and 2 may be biased. To overcome this problem, we estimate a mixed-process model, which combines a probit for *Reelection-eligible mayor does not run*, with a linear regression

[24]Recent studies, using large-scale controlled trials (e.g. Aker et al., 2015) provide evidence that the dissemination of electoral information matters for voter turnout.

Table 3: Term Limits and Voter Turnout - Extended Models for Municipalities

VARIABLES	(1) Fractional Probit	(2) Beta Regression	(3) Mixed Process	(4) Mixed Process
Term-limited mayor	0.997***	1.017***	0.923**	0.693*
	(3.16)	(3.24)	(2.21)	(1.67)
Share of voters with term-limited parish president	0.017**	0.017**	0.017*	0.017*
	(2.03)	(2.05)	(1.94)	(1.93)
Reelection-eligible mayor does not run	0.193	0.187	0.336	
	(0.96)	(0.92)	(0.07)	
Term-limited mayor * Mayor resigns				-1.348*
				(-1.69)
Term-limited mayor * Mayor runs for M. Assembly				0.287
				(0.48)
Mayor resigns (ResMA=1)				0.489
				(1.27)
Mayor runs for Municipal Assembly (ResMA=2)				0.578
				(1.61)
Number of observations	1,493	1,493	1,493	1,493
Log-likelihood	-955.8	3,685.5	3,164.3	-3,509.7

Notes: The estimation method used in each regression is indicated in the title of the respective column. All models include the control variables considered in Table 2, municipal and election fixed effects, and NUTS III region-specific trends. Marginal effects (in percentage points) are reported for the Fractional Probit and Beta Regression methods. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

for turnout.[25] Again, the results (column 3) indicate no effect of voluntary withdrawals[26] on turnout and confirm the effects of term limits.

A final extension of the DD model for municipalities accounts for heterogeneous effects of term limits on turnout, due to the differences in behavior of incumbent mayors regard-

[25]According to Roodman (2011), the estimation of a model which uses the information about the limited nature of the earlier stage dependent variable is more efficient than a 2SLS estimation, which would treat it as if it were continuous and unbounded. We use Roodman's *cmp* command for *Stata* in our estimations.

[26]The probit model, whose results are available upon request, includes all explanatory variables of the model for turnout, to which we added the mayors' age, dummies for gender and for residence and birth in the municipality, and the number of terms in office.

ing the 2013 municipal elections. While 61 term-limited mayors (the true lame-ducks) remained in office until the end of their terms and did not run for other local offices, 10 ran for mayor in a different municipality, 21 resigned before the end of their terms (being replaced by their deputy-mayors, most of whom ran for mayor in 2013), and 75, including seven of the resigning mayors, ran for president of the Municipal Assembly. It is likely that the effects of term limits are different in the last two cases. First, resigning mayors stepped down some months before the elections, allowing the deputy-mayors that replaced them some time to gain incumbency advantage. Second, a term-limited mayor who ran for president of the Municipal Assembly was still involved in the local elections of her municipality.

In order to account for these cases, we created the categorical variable ($ResMA$) which takes the value of one for mayors who resigned before the end of their terms, equals two for those that ran for president of the Municipal Assembly, and equals zero otherwise. Then, we extend the model of equation (1) by interacting the dummy variable for term-limited mayors with dummy variables for resigning mayors ($ResMA = 1$) and for those who ran for the Municipal Assembly ($ResMA = 2$). The extended model is then:

$$\begin{aligned} Turnout_{it} =& \alpha + \delta TLMayor_{it} + \kappa_1(TLMayor_{it} * (ResMA = 1)_{it}) + \\ & \kappa_2(TLMayor_{it} * (ResMA = 2)_{it}) + \kappa_3(ResMA = 1)_{it} + \\ & \kappa_4(ResMA = 2)_{it} + \mathbf{X}'_{it}\gamma + \mu_i + \lambda_t + \theta_i.t + \varepsilon_{it}. \end{aligned} \tag{3}$$

$$i = 1, ..., 308 \qquad t = 1997, 2001, 2005, 2009, 2013$$

One problem with the estimation of equation (3) is that a mayor's decision to resign or to run for president of the Municipal Assembly may be affected by the existence of binding term limits. Thus, $ResMA$ is endogenous. To overcome this problem, we estimate a mixed-process model which combines a multinomial probit for $ResMA$ with a linear regression model for turnout. The results, show in column 4 of Table 3, indicate a positive effect of term limits on turnout for the base category of term-limited mayors.[27] The effect when they ran for president of the Municipal Assembly appears to be the same,

[27]The interpretation of the estimated coefficients is the following. In the case of our base category (the

as the interaction with ($ResMA = 2$) is not statistically significant. Finally, although the overall effect in the municipalities whose mayors resigned and were replaced by their deputy-mayors appears to be negative ($-0.655 = 0.693 - 1.348$), a Wald test does not reject the hypothesis that the effect is equal to zero.

5.2. Results for parishes

Table 4 reports the results of the estimation of the models of equation (2) for 2,163 parishes whose territorial boundaries were not altered during the sample period. As for municipalities, we use as dependent variable the voter participation rates in the elections for the Town Council, which are practically equal to those for the other two concurrent local elections (Municipal Assembly and Parish Assembly), with correlation rates of 99.9%. The procedure adopted was, again, to start with the estimation of the full model (column 1), exclude the variables with problematic VIFs (column 2), and use the AIC and the BIC to guide the selection of the most appropriate parsimonious model (columns 3-5).

Table 4: Term Limits and Voter Turnout - Parishes

VARIABLES	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fractional Probit	(5) Beta Regression
Term limits variables					
Term-limited mayor	1.088***	1.016***	1.069***	1.170***	1.187***
	(3.52)	(3.25)	(4.34)	(4.89)	(4.97)
Term-limited parish president	0.910**	0.983**	0.956***	0.956***	0.969***
	(2.43)	(2.57)	(3.87)	(4.00)	(4.06)
TL mayor * TL parish president	0.133	0.0138			
	(0.28)	(0.03)			
Control variables at the parish level					
Unemployment rate	0.0240	0.00856			
	(0.71)	(0.26)			
Log(Population)	-6.530***				
	(-5.91)				

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true lame ducks and of those who ran in another municipality) $ResMA$ equals zero, and the effect of term limits is given by δ. Statistical significance of κ_1 or κ_2 indicates that the effect for the respective type of mayors is different from that for the base category. For example, the effect for resigning term-limited mayors is $\delta + \kappa_1$.

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VARIABLES	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fractional Probit	(5) Beta Regression
Population growth (absolute value)	-0.0644**	-0.0133			
	(-2.15)	(-0.62)			
Share of population over 65 years old	-0.0467	0.0349			
	(-1.26)	(1.03)			
Share of pop. with less than primary education	-0.0827***	-0.0830***	-0.0793***	-0.0750***	-0.0725***
	(-2.82)	(-2.92)	(-2.87)	(-2.76)	(-2.67)
Share of population employed in the tertiary sector	0.0633*	0.0327			
	(1.70)	(0.98)			
Effective number of parties (Parish Assembly)	3.026***	2.850***	3.030***	3.093***	3.152***
	(7.66)	(7.52)	(7.90)	(8.01)	(7.86)
Margin of victory (previous election)	-0.0125***	-0.0133***	-0.0130***	-0.0131***	-0.0133***
	(-3.63)	(-3.92)	(-3.78)	(-3.85)	(-3.88)
Party similarity (parish president and mayor)	-0.318***	-0.386***	-0.408***	-0.398***	-0.391***
	(-2.73)	(-3.36)	(-3.56)	(-3.44)	(-3.37)
Presence of independent lists	0.948***	0.906***	0.912***	0.918***	0.924***
	(5.63)	(5.36)	(5.76)	(5.78)	(5.79)
Average past vote share of left-wing parties	-0.0159*	-0.00959			
	(-1.91)	(-1.18)			
Average past turnout	-0.00463				
	(-0.21)				
Control variables at the municipal level					
Log(Average real wage)	1.760**				
	(2.01)				
Log(Own revenues - real per capita)	0.853***				
	(3.26)				
Effective number of parties (Town Council)	-0.440**				
	(-2.46)				
Mayor's margin of victory (previous election)	-0.0330***	-0.0243***	-0.0231***	-0.0235***	-0.0233***
	(-6.32)	(-5.49)	(-5.24)	(-5.34)	(-5.29)
Party similarity (mayor and prime minister)	-0.367***	-0.340***	-0.324***	-0.305***	-0.298***
	(-3.34)	(-3.11)	(-2.93)	(-2.81)	(-2.75)
Presence of independent lists	0.0864	0.0748			
	(0.49)	(0.42)			
Number of observations	10,281	10,666	10,756	10,756	10,756
Number of parishes	2,144	2,144	2,163	2,163	2,163
Adj. R^2 (FE), Pseudo R^2 (Frac. Probit)	0.342	0.331	0.330	0.026	
Log-likelihood	19,138	19,725	19,826	-6,700	19,861

Notes: The estimation method used in each regression is indicated in the title of the respective column.

All models include election dummies, and NUTS III region-specific trends. Robust t-statistics in parentheses.

Marginal effects are reported for the Fractional Probit method. *** p<0.01, ** p<0.05, * p<0.1.

The results reinforce our conclusion that the introduction of term limits at the local level had a positive effect on voter turnout. The dummy variables for term-limited mayors and parish presidents always have positive and statistically significant coefficients. Since the interaction term is not statistically significant, there is no evidence of a total effect which goes beyond the sum of the individual effects. This sum is between 1.998 and 2.156 percentage points, which implies that voter turnout increased by roughly 3% in parishes that, simultaneously, had a term limited-president and belonged to a municipality with a term-limited mayor.

Regarding the control variables kept in the parsimonious model, the effective number of parties and the presence of independent lists at the parish level are positively related to turnout, while lower levels of education, greater margins of victory and party similarity (at both levels) are negatively associated with turnout. These results are in line with those for municipalities, shown in Table 2. The main differences are the lack of statistical significance, at the parish level, of unemployment rates, population growth, and of the share of the population that is employed in the tertiary sector. Additionally, the log of population has a problematic VIF, which led to its exclusion from the estimations for parishes.

Although the models of Table 4 include data at both the parish and municipal levels, the estimation methods used do not take the hierarchical structure of the data into account.[28] Thus, they are unable to disentangle the contributions of the hierarchical levels and can lead to biased standard errors, because parishes belonging to the same municipality may share unobserved common factors and thus not be independent.

In order to overcome these potential problems, and as a robustness check, we estimate multilevel mixed-effects linear regression models[29] using parish data. As before, we start

[28]Since each parish always belongs to the same municipality, we have a multilevel hierarchical dataset, with parishes in the first level and municipalities in the second.

[29]For details on multilevel longitudinal models, see Rabe-Hesketh and Skrondal (2012). One drawback of these models is that, like fixed effects, they do not take the bounded nature of the dependent variable into account. Therefore, we face a trade-off. These models deal better than those of Table 4 with the multilevel nature of the data, but deal worse with the boundedness of the dependent variable than

with the full model, exclude the variables with high VIFs, and proceed to the selection of the most appropriate parsimonious model. To economize space, only the parsimonious' model estimation results are reported in Table 5. In column 1, we assume random intercepts at the parish and municipal levels, and in column 2 we additionally assume random slopes for the term limits' dummy variables at the municipal level.

The results reported in Table 5 are very similar to those of Table 4, and provide further evidence supporting the hypothesis that term limits have positive effects on voter turnout. Regarding the control variables, the main differences are that the average past vote share of left-wing parties and the share of the population employed in the tertiary sector are now statistically significant, with the expected negative signs.

Table 5: Multilevel Mixed-Effects Linear Regressions for Parishes

VARIABLES	(1) Random Intercepts	(2) Random Intercepts & Slopes
Term limits variables		
Term-limited mayor	0.959***	0.889***
	(4.43)	(2.72)
Term-limited parish president	0.877***	0.877***
	(4.14)	(3.30)
Control variables at the parish level		
Population growth (absolute value)	-0.0367***	-0.0420***
	(-2.68)	(-3.12)
Share of population with less than primary education	-0.0883***	-0.0998***
	(-5.80)	(-6.58)
Share of population employed in the tertiary sector	-0.0637***	-0.0643***
	(-3.55)	(-3.59)
Effective number of parties in the Parish Assembly	1.605***	1.533***
	(9.93)	(9.55)
Parish president's margin of victory (previous election)	-0.0141***	-0.0149***

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fractional probit and beta regression models.

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VARIABLES	(1) Random Intercepts	(2) Random Intercepts & Slopes
	(-4.95)	(-5.32)
Party similarity (parish president and mayor)	-0.466***	-0.456***
	(-4.19)	(-4.17)
Presence of independent lists	0.949***	1.038***
	(6.64)	(7.21)
Average past vote share of left-wing parties	-0.0148***	-0.0237***
	(-2.64)	(-4.06)
Control variables at the municipal level		
Mayor's margin of victory (previous election)	-0.0248***	-0.0272***
	(-5.86)	(-6.37)
Party similarity (mayor and prime minister)	-0.312***	-0.274**
	(-2.94)	(-2.20)
Number of observations	10,754	10,754
Number of parishes	2,144	2,144
Number of municipalities	302	302
Log-likelihood	-33,615	-33,471

Notes: All models include election dummies and NUTS III region-specific trends. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

5.3. Robustness tests

Besides estimating the models for municipalities and for parishes with alternative methods, and trying alternative explanatory variables, we checked the robustness of the results in several additional ways. First, we used municipal-specific trends instead of regional trends. Second, we used a single trend for the treated municipalities, instead of regional trends. Third, we restricted the time period to 2001-2013, so that only 21st Century elections were considered. Fourth, we defined the participation rate using as denominator the population that is at least 15 years old,[30] instead of the number of

[30]There is no data available on the population that is 18 years old (the required age to vote) or above.

registered voters. The main results remained practically the same and our conclusions regarding the effects of term limits on voter turnout were unchanged (see Tables B.1 and B.2 in Appendix B).

A final robustness check consisted of a placebo test using only pre-treatment data. Concretely, we coded the term limit variables as if the mayors and parish presidents that were term-limited in the term leading to the 2013 elections had been term-limited in the term leading to the 2009 elections. As shown in the last row of Tables B.1 and B.2, the dummy variable for a term-limited mayor is never statistically significant. The same applies to the share of term-limited parish presidents in the estimations for municipalities (Table B.1). Although the dummy for a term limited parish president is statistically significant in the placebo test for parishes (Table B.2), it has a negative sign, the opposite of what we obtained in Tables 4 and 5. That is, the placebo test shows that the positive effect on turnout in treated municipalities/parishes was not present before treatment (before term limits became binding).

6. Conclusions

Despite the extensive and fast-growing literature on the determinants of voter turnout (Dhillon and Peralta, 2002; Cancela and Geys, 2016) and the considerable number of studies analyzing potential effects of term limits (Mooney, 2009), only a couple of studies bridge these two topics. To the best of our knowledge, the effects of term limits on voter turnout have only been analyzed for California (Nalder, 2007; Hajnal and Lewis, 2003). This paper helps filling this gap in the literature by studying the impact on voter turnout of the recent introduction of term limits at the local government level in Portugal. For that purpose, a difference-in-differences framework is applied to two different panel datasets, spanning the period from 1997 to 2013: one comprising all 308 Portuguese municipalities; and, another, for 2,163 parishes whose territorial boundaries were unchanged during the sample period.

Contrary to previous findings, which suggest a negative effect (Nalder, 2007) or no effects (Hajnal and Lewis, 2003), our results clearly and robustly indicate that term limits

increased voter turnout. Both the presence of a term-limited mayor and of a term-limited parish president have positive and statistically significant effects on voter participation at municipal elections. These results are robust to the use of alternative estimation methods, to changes in the list of control variables, to the inclusion of municipal-specific trends or a single treated-group trend (instead of regional-specific trends), to restrictions of the time-period, and to alternative definitions of turnout.

The sharp difference between our results and those of Nalder (2007) may be due to several factors. First, we study municipal elections, which determine who becomes mayor or parish president, while Nalder (2007) studies state legislative elections. It is possible that the differences in results are at least partially due to differences in the effects of term limits for executives and for legislators. Second, state legislative elections occur at the same time of other, more important, concurrent elections, which may lead to lack of interest of voters, while municipal elections in Portugal never occurred in the same day (or month) of other elections. Third, Nalder (2007) includes the contemporaneous vote margin, which is clearly endogenous,[31] as an explanatory variable, and other differences in the econometric specification may help explain some of the differences in results.

More importantly, the removal of more than half of the mayors, and of hundreds of parish presidents, at the same time may have had a considerably impact on voters' decisions to participate in the Portuguese 2013 local elections, which may not be present in cases that involve a considerably smaller percentage of incumbents being removed from office. First, this unusual turnover led to greater media coverage of local elections which, according to information-based theories, may have led to increased voter participation. Second, the ousting of entrenched mayors, who managed to win election after election for decades, gave a unique opportunity to voters to express their views. It also gave opposition candidates a fighting chance, thus contributing to enhanced competition and

[31]Since term limits lead to more open races, they generate more competition and smaller winning margins (closer elections). Thus, the contemporaneous vote margin is endogenous to another explanatory variable (term limits), and should not be included in the model. We avoid that problem by using the winning margin in the previous elections as a proxy.

to a greater instrumental value of voting. Therefore, we believe that the positive effect of binding term limits on voter participation resulted from the joint effect of instrumental, expressive and informational motives for voting.

Another important contribution of our work is to show that the effects of term limits may differ under different circumstances. That is, the results of Nalder (2007) for California's state legislative elections cannot be generalized, and it is too soon to conclude that term limits discourage voter participation. Therefore, our findings have implications for the normative debate on the desirability of term limits and reveal that the in-depth evaluation of the consequences of this institutional reform, for different countries, types of elections, and institutional rules, remains an important avenue for further research.

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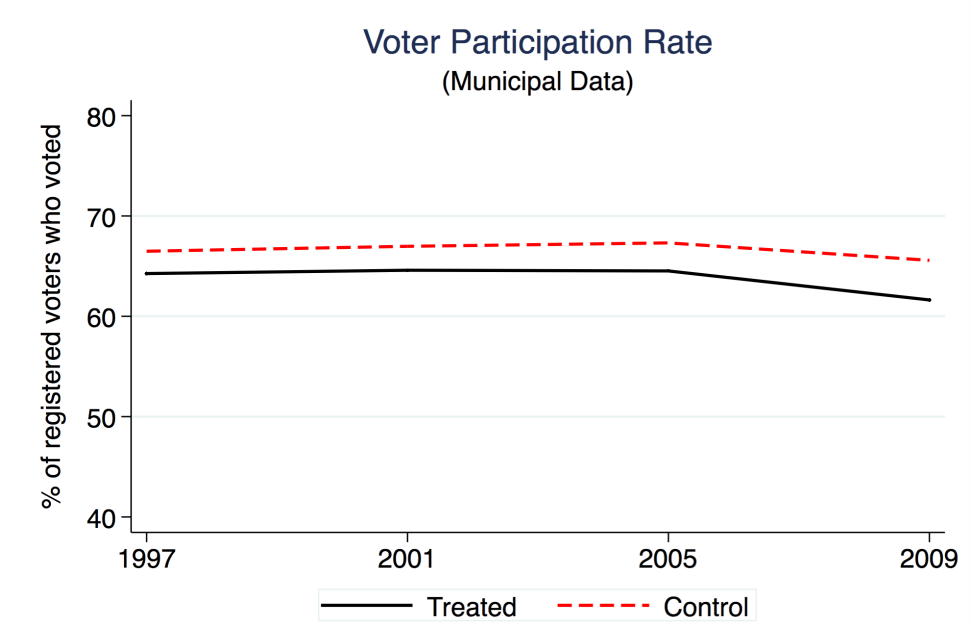
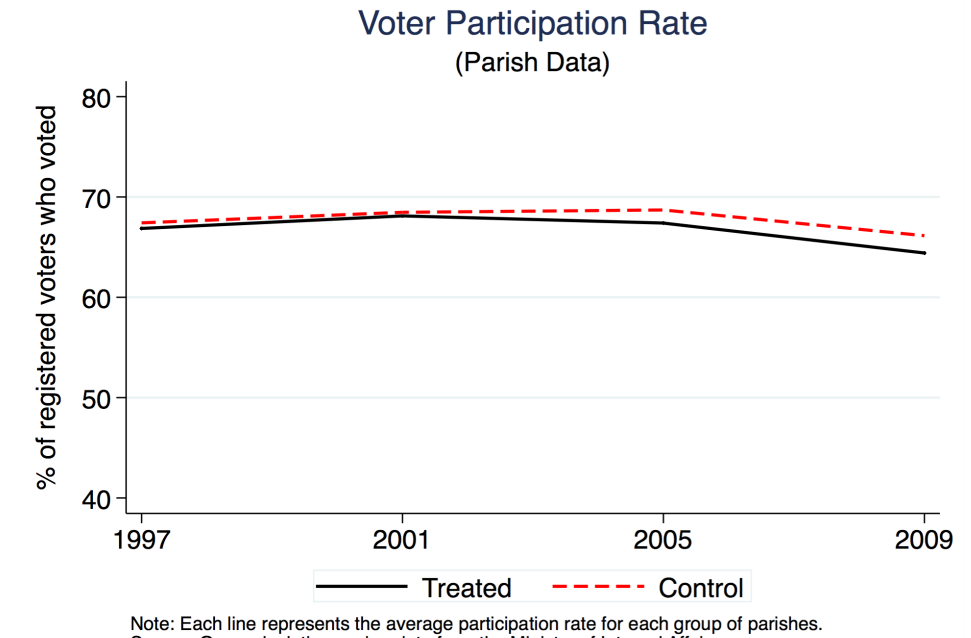
Appendix A. Participation Rates in Treated and Control Groups



Note: Each line represents the average for each group of municipalities.
Source: Own calculations using data from the Ministry of Internal Affairs.



Note: Each line represents the average participation rate for each group of parishes.
Source: Own calculations using data from the Ministry of Internal Affairs.

Figure A.1: Voter Participation Rates in the Treated and Control Groups

Appendix B. Robustness Tests

Table B.1: Robustness Tests for Municipalities

	(1)	(2)	(3)
	Fixed Effects	Frac. Probit	Beta Regression
Using municipal trends instead of regional trends			
Term-limited mayor	1.549***	1.637***	1.664***
	(3.42)	(4.17)	(4.26)
Share of voters with term-limited parish president	0.0368***	0.0354***	0.0350***
	(2.78)	(3.08)	(3.09)
Using a single trend for treated municipalities instead of regional trends			
Term-limited mayor	1.387***	1.467***	1.472***
	(3.27)	(3.58)	(3.60)
Share of voters with term-limited parish president	0.00374	0.00423	0.00427
	(0.44)	(0.52)	(0.54)
Using data only since 2001			
Term-limited mayor	0.947***	1.014***	1.032***
	(2.85)	(3.21)	(3.29)
Share of voters with term-limited parish president	0.0166*	0.0167**	0.0169**
	(1.91)	(2.01)	(2.03)
Defining turnout relative to the population that is 15 or more years old			
Term-limited mayor	1.047***	1.131***	1.077**
	(2.75)	(2.95)	(2.53)
Share of voters with term-limited parish president	0.0118	0.0162	0.0179*
	(1.10)	(1.54)	(1.66)
Placebo test for treatment in the 2009 elections			
Term-limited mayor	-0.151	-0.0591	-0.0436
	(-0.29)	(-0.13)	(-0.10)
Share of voters with term-limited parish president	-0.00187	-0.00262	-0.00372
	(-0.11)	(-0.18)	(-0.25)

Notes: The estimation method used in each regression is indicated in the title of the respective column. All models include municipal and election fixed effects, and the control variables of the parsimonious models of columns 2-4 of Table 2. NUTS III region-specific trends are included, except when otherwise indicated. Marginal effects are reported for Fractional Probit and Beta Regression methods. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B.2: Robustness Tests for Parishes

	(1) Fixed Effects	(2) Fractional Probit	(3) Beta Regression
Using municipal trends instead of regional trends			
Term-limited mayor	0.941***	0.906***	0.924***
	(2.85)	(2.74)	(2.71)
Term-limited parish president	0.781**	0.809**	0.752**
	(2.28)	(2.33)	(2.12)
Using a single trend for treated municipalities instead of regional trends			
Term-limited mayor	0.827***	0.934***	0.940***
	(3.25)	(3.79)	(3.83)
Term-limited parish president	1.164***	1.139***	1.148***
	(4.10)	(4.10)	(4.16)
Using data only since 2001			
Term-limited mayor	1.081***	1.180***	1.199***
	(3.61)	(4.06)	(4.14)
Term-limited parish president	0.885**	0.900**	0.915**
	(2.41)	(2.51)	(2.54)
Defining turnout relative to the population that is 15 or more years old			
Term-limited mayor	1.405***	1.424***	0.982**
	(4.07)	(4.05)	(2.54)
Term-limited parish president	0.861**	0.861**	0.869**
	(2.54)	(2.49)	(2.34)
Placebo test for treatment in the 2009 elections			
Term-limited mayor	-0.0510	0.0600	0.0768
	(-0.22)	(0.26)	(0.33)
Term-limited parish president	-0.773***	-0.737***	-0.738***
	(-3.49)	(-3.38)	(-3.40)

Notes: The estimation method used in each regression is indicated in the title of the respective column. All models include municipal and election fixed effects, and the control variables of the parsimonious models od columns 3-5 of Table 4. NUTS III region-specific trends are included, except when otherwise indicated. Marginal effects are reported for Fractional Probit and Beta Regression methods. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix C. Descriptive Statistics

Table C.3: Descriptive Statistics for Municipalities

VARIABLES	N. Obs.	Mean	SD	Min	Max
Dependent and term limits variables					
Turnout (participation rate of registered voters)	1,493	63.87	8.274	37.77	83.43
Term-limited mayor	1,493	0.107	0.309	0.00	1.00
Re-election eligible mayor does not run	1,493	0.128	0.334	0.00	1.00
Mayors resigns (=1) or runs for other office (=2)	1,493	0.206	0.582	0.00	2.00
Share of voters with term-limited parish president	1,493	3.358	10.84	0.00	100.00
Control variables					
Unemployment rate	1,493	6.718	2.882	1.27	18.29
Log(Average real wage)	1,474	6.728	0.171	6.32	7.56
Log(Own revenues - real per capita)	1,493	5.517	0.533	3.72	7.49
Log(Population)	1,493	9.755	1.108	6.05	13.32
Population growth (absolute value)	1,493	4.165	3.453	0.002	29.59
Share of population over 65 years old	1,493	21.34	6.352	7.76	44.28
Share of population with less than primary education	1,493	13.59	5.099	4.14	35.29
Share of population employed in the tertiary sector	1,493	23.05	6.260	10.37	44.37
Effective number of parties (Town Council)	1,493	2.011	0.393	1.00	4.46
Mayor's margin of victory (previous election)	1,493	19.44	14.13	0.02	75.75
Party similarity (mayor and prime minister)	1,493	0.408	0.492	0.00	1.00
Presence of independent lists	1,493	0.303	0.460	0.00	1.00
Average past vote share of left-wing parties	1,493	50.77	19.70	3.83	95.75
Average past turnout	1,493	65.73	6.829	43.98	82.79
Number of municipalities	308	308	308	308	308

Sources: Ministry of Internal Affairs (MAI), National Statistics Institute (INE), Directorate General for Local Authorities (DGAL), Institute for Employment and Professional Training (IEFP), *Quadros de Pessoal* database of the Ministry of Labor, Solidarity and Social Security.

Table C.4: Descriptive Statistics for Parishes

VARIABLES	N. Obs.	Mean	SD	Min	Max
Dependent and term limits variables					
Turnout (participation rate of registered voters)	10,756	66.25	9.374	28.73	95.84
Term-limited mayor	10,756	0.108	0.311	0.00	1.00
Term-limited parish president	10,756	0.082	0.274	0.00	1.00
Term-limited mayor * Term-limited parish president	10,756	0.048	0.215	0.00	1.00
Control variables with data at the parish level					
Unemployment rate	10,666	5.857	3.530	0.00	29.01
Log(Population)	10,756	7.029	1.081	4.53	11.11
Population growth (absolute value)	10,756	5.229	4.664	0.00	138.3
Share of the population above 65 years old	10,756	23.72	10.31	4.59	65.44
Share of population with less than primary education	10,756	21.02	6.814	0.00	60.71
Share of population employed in the tertiary sector	10,754	18.17	7.734	0.00	56.60
Effective number of parties (Parish Assembly)	10,756	2.113	0.662	1.00	8.00
Parish pres. margin of victory in the previous election	10,756	25.03	19.69	0.00	97.80
Party similarity (parish president and mayor)	10,756	0.655	0.475	0.00	1.00
Presence of independent lists	10,756	0.171	0.377	0.00	1.00
Average past vote share of left-wing parties	10,756	45.71	19.82	0.57	97.86
Average past turnout	10,756	67.69	8.185	29.62	90.68
Control variables with data at the municipal level					
Log(Average real wage)	10,369	6.695	0.148	6.32	7.56
Log(Own revenues - real per capita)	10,756	5.381	0.502	3.72	7.49
Effective number of parties (Town Council)	10,756	1.980	0.355	1.00	4.46
Mayor's margin of victory (previous election)	10,756	19.58	13.94	0.02	75.75
Party similarity (mayor and prime minister)	10,756	0.423	0.494	0.00	1.00
Presence of independent lists	10,756	0.316	0.465	0.00	1.00
Number of parishes	2,163	2,163	2,163	2,163	2,163

Sources: Ministry of Internal Affairs (MAI), National Statistics Institute (INE), Directorate General for Local Authorities (DGAL), Institute for Employment and Professional Training (IEFP), *Quadros de Pessoal* database of the Ministry of Labor, Solidarity and Social Security.

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